*Belemnoziphius prorops.*—Beak solid, with all traces of the original separation of the constituent bones and the ossified mesethmoid cartilage obliterated.—*Proc. Acad. Nat. Sci. Philad.*, May 9.

*Reply to some Observations by Mr. Gwyn Jeffreys on the Cruise of H.M.S. 'Valorous' in* 1875. By G. C. Wallich, M.D.

*To the Editors of the Annals and Magazine of Natural History.*

Gentlemen,—It is mentioned amongst the "British Association Notes" of the 'Athenæum' for September 16th that, in a paper read at the Meeting by Mr. Gwyn Jeffreys on the results of the voyage of H.M.S. 'Valorous' to Disco in 1875, he described "the occurrence of large and small stones in his dredgings, and said that telegraphic cables had usually been constructed too much on the supposition that the sea-bottom was always soft; consequently they are very liable to damage when this is not the case."

During the voyage of H.M.S. 'Bulldog' in 1860 to the Faroe Islands, Iceland, Greenland, and Labrador, stones and gravel were repeatedly brought up from very great depths. Moreover a living *Serpula*, within its tube, which had evidently but then been broken off from its point of attachment to a stone or rock, together with a dead *Serpula*-shell still adherent to a granitic stone of considerable size, were obtained, nearly midway between the Faroes and Iceland, under conditions which would seem to indicate the presence of a deep-seated current, or rather drift, of sufficient power at all events to prevent any material accumulation of muddy deposit in that locality.

These several facts and their extreme importance in relation to deep-sea telegraphy were on various occasions referred to by me between the years 1860 and 1864, namely:—in my 'Notes on the presence of Animal Life at great Depths in the Ocean,' 1860, pp. 30, 31, & 37; in my 'North-Atlantic Sea-bed,' 1862, pp. 2–7 & 147; in my paper read before the Royal Geographical Society in 1863*; in my "Outline of a Scheme for a systematic Survey of the Sea-bed," laid before the Council of the Royal Geographical Society in 1863 (of which a reprint appeared in the 'Annals' for July of the present year, p. 80); and lastly, in a paper, "On the North-Atlantic Sea-bed," in the 'Quarterly Journal of Science' for January 1864.

I will confine myself to giving the following extract from the paper last referred to:—

"There is one point to which I must invite attention, inasmuch as its importance can hardly be overestimated; and yet, strange to say, it has heretofore been almost entirely overlooked.

"In some of the deeper soundings both of the North and Mid-Atlantic routes†, fragments of rock have been brought up. How is the occurrence of these to be accounted for? and what does it

* On that occasion I exhibited an instrument, which I called a *Perimeter*, designed by me for the purpose of readily detecting the occurrence of rocky or stony bottom at any depth.

† The occurrence in the Mid-Atlantic of a few "small stones" was noted in the tabulated lists of soundings taken by Commander Dayman, R.N., in the Atlantic in 1867.

betoken ? The question is an intricate one, and so far as our present information goes does not seem to admit of a perfectly satisfactory solution. This much may be said, however, that their presence on the immediate surface-layer of the sea-bed is only reconcilable with one or other of the following suppositions :—They must either have been recently dropped by some means from the superincumbent waters, have been deposited by floating ice during past periods of the earth's history, must occur in beds which were once exposed above the surface of the sea, or be drifting about the bottom through the action of currents.

" Now in no case hitherto recorded have these stones been of large size, probably not larger than a hazel-nut * ; but they present undoubted traces of attrition. Fish, as is well known, sometimes swallow small stones and, as a matter of course, get rid of them in time ; but this would not meet the requirements of the first of the above suppositions, inasmuch as it is obviously improbable that so many fish with stones in their stomachs should be moving about the ocean as would be necessary to account for the fact. It is still more improbable, if not impossible, that fish could have conveyed such substances from the distant shores where they are alone obtainable. So that, viewing this circumstance in conjunction with the fact that no floating ice now-a-days traverses the areas referred to, it is certain the matter is inexplicable on the first supposition.

" If deposited from floating ice during *past* periods of the earth's history (according to the second supposition, which is by no means impossible), it follows as an inevitable consequence that the muddy deposits are local in character, and that certain areas of the sea-bed consist of bare rock, or that they are swept away by currents as fast as they are produced. I regard the first of these causes as most conformable with the evidence ; for although there is reason to believe that deep-seated currents prevail with sufficient force, in some of the shallower tracts of the Atlantic, to move the fine particles of which these deposits are for the most part composed, there is no ground whatever for supposing that they are ever powerful enough to sweep along large objects such as the stones of which I have been speaking †. It will be seen, therefore, that we are justified in laying stress on the possibility that extensive areas of exposed rock may occur along the basin of the Atlantic, which have hitherto escaped detection. The third and fourth suppositions are thus disposed of likewise." (*Loc. cit.* p. 39.)

As it is stated in the number of the 'Athenæum' already referred to by me that Mr. Gwyn Jeffreys's paper is to be hereafter reproduced in the 'Proceedings' of the Royal Society, I beg leave to bring the above facts and observations to his and your readers' notice.

I remain, Gentlemen,

Your very obedient Servant,

September 19, 1876. G. C. Wallich.

* This is not quite accurate. As stated in 'The North-Atlantic Sea-bed,' p. 3, the piece of granite to which the dead *Serpula* is attached measures about an inch square.

† See 'North-Atlantic Sea-bed,' pp. 4–7.